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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LUKS, JEREMY AUSTIN

ART UNIT	PAPER NUMBER
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2837

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Please find below and/or attached an Office communication concerning this application or proceeding.

8/1

Office Action Summary	Application No. 10/783,705	Applicant(s) MEYER ET AL.	
	Examiner Jeremy Luks	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/6/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 20 objected to because of the following informalities: The forth word in the claim, "or" should read "of". Appropriate correction is required.
2. Claim 22 objected to under 37 CFR 1.75 as being a substantial duplicate of Claim 20. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 7-11, 14-20 and 22-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Lehman (6,394,223).

With respect to Claims 1-5, 11, 14, 15, 17-20 and 22-28, Lehman teaches a throat end (Figure 8, #13) having an elongated rectangular throat (14) and aligned coupling chambers (Figure 1, #17A) for coupling acoustic power produced by aligned acoustic power sources (Figure 2, #13A-13D) having a circular geometry to the rectangular geometry (Figure 2 - see connection of #13D with base of 14D) of the horn's (Figure 1, #15) elongated throat (Figure 8, #14), said elongated throat (14) having a top,

a bottom, and elongated sides defining a long dimension, whereby aligned acoustic power sources (Figure 2, #13A-13D) are mounted to the throat (Figure 8, #14) end of said horn (Figure 1, #15) and spaced apart by at least one wavelength at the highest operating frequency of the loudspeaker (Col 3, Lines 22-35); and a flared section (Figure 1, #15A) extending from said throat end (Figure 8, #14), said flared section (Figure 1, #15A) having end walls (15C) extending from the top and bottom of said throat (14) and flared side walls (15C) extending from the elongated sides of said throat (14); and a mouth end (Figure 1, #15 B) at the end of the flared section (15A) opposite said throat end (Figure 8, #13) through which acoustic power is received at said throat end (13) is propagated from the loudspeaker horn (Figure 1, #15) into space; and grating lobe mitigation fins (Figure 8, #81) disposed in said flared section (Figure 1, #15A) between the end walls (15C) thereof, said grating lobe mitigation fins (Figure 8, #81) being disposed in planes substantially perpendicular to the long dimension of said throat (14) and substantially parallel to the horn's propagation axis, and extending for a substantially the entire length from the throat (14) of the horn (Figure 1, #15) toward the mouth end (15B) of said flared section (15A) for mitigating grating lobes produced by aligned acoustic power sources (Figure 2, #13A-13D) at the throat end (Figure 8, #13) of the horn (15).

With respect to Claim 16, Lehman teaches said grating lobe mitigation fins (Figure 8, #81) are tapered in the direction of the mouth end (Figure 1, 15B) of the horn (15).

With respect to Claim 7, Lehman teaches grating lobe mitigation fins (Figure 8, #81) each having a base end which extends into the throat end (Figure 8, #13) of the horn (15) to isolate the coupling chambers (Figure 1, #17A) one from the other and to divide the elongated throat (14) into aligned throat (14) openings associated with each acoustic power source (Figure 2, #13A-13D) of said aligned acoustic power sources (Figure 2, #13A-13D).

With respect to Claim 8-10, Lehman teaches the throat (Figure 1, # 14(a-d)) end of the horn (15) includes a mounting surface (10); and is formed to received acoustic power from N aligned acoustic power sources (13A-13D) where N is an integer, and wherein N-1 grating lobe mitigation fins (Figure 8, #81) are provided between the end walls (Figure 1, #15C) of said flared section (15A).

With respect to Claims 29-32, Lehman teaches length of said grating lobe fins (Figure 8, #81) is determined empirically by choosing a desired matched acoustic power sources (Figure 2, #13A-13D) for the aligned array of acoustic power sources (13A-13D), determining the length of the grating lobe fins (Figure 8, #81) needed to achieve directional characteristics for a single one of the aligned acoustic power sources (Figure 2, #13A-13D) that suppresses off-axis acoustic power for the acoustic power source (13A-13D) in the region of the predicted grating lobes for the aligned power sources (13A-13D) to the desired suppression levels for the grating lobes, and providing the flared section (Figure 1, #15A) of the horn (15) with grating lobe fins (Figure 8, #81) of the determined length using the single acoustic power source (Figure 2, #13A-13D), or longer (Col. 4, Lines 26-49; Col.5, Lines 31-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman (6,394,223) in view of Danley (4,845,759). Lehman is relied upon for the reasons and disclosures set forth above. Lehman fails to disclose the size of each of the coupling chambers being in the order of one wavelength or smaller at the highest operating frequency of the loudspeaker. However, Danley discloses coupling chambers (Figure 1, #10) sized in the order of one wavelength or smaller at the highest operating frequency of the loudspeaker (Col 1, Lines 38-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Lehman, with the design of Danley to allow the speaker drivers to act together as a virtual point source, permitting mutual reinforcement. Since the drivers are closely spaced, the dispersion patterns of adjacent

sources compliment one another and are more effective and power efficient in a multiple loudspeaker embodiment.

5. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman (6,394,223) in view of Gunness (6,016,353). Lehman is relied upon for the reasons and disclosures set forth above. Lehman fails to disclose a mounting surface having aligned circular openings therein associated with said coupling chambers for mounting multiple circular acoustic power sources to the throat end of the horn in aligned relation with the horn's elongated rectangular throat open. However, Gunness discloses a flanged rectangular mounting surface (Figure 2b, #84b) having aligned circular openings therein associated with coupling chambers (Col. 5, Lines 40-43) for mounting multiple circular acoustic power sources (56b, 58b) to the throat end (66b, 68b) of the horn (46b, 48b) in aligned relation with the horn's (46b, 48b) elongated rectangular throat open (74b, 76b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Lehman with the apparatus of Gunness to provide a stable mounting system that will alleviate strain on the elongated throat caused by the weight of the driver, which will be supported by the rectangular flange. This design will also keep out unwanted noise and vibrations propagating from the rear of the driver because it will be external from the housing enclosure.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pertinent arts of record relating to loudspeaker horns and

methods of controlling grating lobes in a line array of acoustic sources are disclosed in the PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy Luks whose telephone number is (571) 272-2707. The examiner can normally be reached on Monday-Thursday 8:30-6:00, and alternating Fridays 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Bradley can be reached on (571) 272-2800 x33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeremy Luks
Patent Examiner

Art Unit 2837

A handwritten signature in black ink, appearing to read 'Edgardo San Martin', is written over a light gray grid background.

Edgardo San Martin
Primary Examiner